

USE OF SHUNT RESISTOR WITH LARGE RA PRODUCT TUNNEL BARRIERS

Abstract of the Disclosure

A read head for use with an interconnect transmission line having a characteristic impedance of Z_0 includes a tunnel valve device and a shunt resistor R_S that is connected in parallel across the tunnel valve device. The tunnel valve device has a device resistance R_T corresponding to a predetermined resistance-area (RA) product. The value of the
5 shunt resistance is based on the parallel combination of R_T and R_S substantially equaling the characteristic impedance Z_0 of the interconnect transmission line. The predetermined resistance-area (RA) product is about equal to at least about $10 \text{ Ohms-}\mu\text{m}^2$. Alternatively, the predetermined resistance-area (RA) product is about equal to a “corner” value of RA_c for the tunnel valve device.